JOINT CHEMICAL AGENT DETECTOR (JCAD)

Joint ACAT III Program		**Prime Contractor**
Total Number of Systems:	257,135	BAE SYSTEMS
Total Program Cost (TY$):	$563M	
Average Unit Cost (TY$):	$2,010	
Full-rate production:	2QFY02	

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The Joint Chemical Agent Detector (JCAD) is a pocket-sized device that will automatically detect, identify, quantify, and warn users of the presence of nerve, blister, and blood chemical agents, as well as several common toxic industrial chemicals. JCAD will be mounted on a vehicle, tripod, aircraft or ship, or fastened to the operator's load bearing equipment. The system will be capable of being operated as a stand-alone detector or, by interface with the Joint Warning and Reporting Network (JWARN), as part of a network of detectors.

JCAD's hardware consists of the main Detector Unit (DU); a pre-concentrator accessory for extending the lower detection limit of the DU; and an interface cradle that includes a mount and connections to interface the DU with external power, external alarms, and other DUs to form a network. One detector configuration is planned for use by all of the Services. JCAD will replace or augment existing Service-unique chemical agent detectors.

JCAD enhances the survivability of both mobile and fixed Joint forces by providing increased situational awareness and ***information superiority*** to supported headquarters and combat elements. By

providing these elements with the real-time capability of detecting chemical agent contamination, JCAD helps provide ***full-dimensional protection*** to the force.

BACKGROUND INFORMATION

A combined Milestone I/II decision was made in December 1997 that allowed JCAD to enter into Engineering and Manufacturing Development. Phase I of the EMD contract was awarded in February 1998, and the Phase II contact option was exercised in April 1999.

The Air Force is JCAD's lead materiel developer, while the Army is the lead developmental and operational evaluator.

JCAD was placed on the DOT&E Oversight List of January 18, 2000. Its potential impact is enormous despite the fact that it is only an ACAT III program.

TEST & EVALUATION ACTIVITY

The Program Director of the U.S. Air Force Human Systems Program Office approved the Milestone I/II TEMP on September 10, 1997. The program has breached its cost and schedule baseline, and due to performance problems the program is being re-baselined. The Program Manager will submit a revised TEMP after program re-baselining has been completed.

During the period from January-March 2000, the Government conducted Engineering Design Testing (EDT) of a brass board hardware and software prototype JCAD. The purpose of this testing was to provide an early assessment of the critical detection, identification, and quantification sub-systems prior to critical design review. This testing, which primarily involved challenging the device with actual chemical agents, chemical agent simulants, and common battlefield interferents, was specifically designed to reduce the Government's risk prior to finalizing the design of the device.

TEST & EVALUATION ASSESSMENT

Although limited in scope, the results of the EDT indicate that JCAD is not ready to proceed beyond the critical design review. The baseline technology demonstrated the capability to detect seven out of ten chemical agents. However, the sensor algorithm requires significant improvement to reliably detect chemical agents at the concentration levels specified in the JCAD Joint Operational Requirements Document (JORD). Test results from final form factor prototypes prior to the critical design review will enable the government to reassess the performance of the algorithm.

CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

The JCAD Program Management office and the prime contractor are aggressively seeking ways to increase JCAD's sensitivity and detection reproducibility. In addition, the Program Manager is currently working with Air Force and Joint acquisition officials to re-baseline the program.

A possible re-baselining scenario is a significant delay in the program combined with a "block" approach to development and fielding. Under this option, a Block I device that could detect and identify some of the chemical agents specified in the JORD would be developed and fielded. A follow-on Block II device would use lessons learned from the Block I device, as well as improvements in technology, to increase the number of agents the device could detect, as well as enhance the sensitivity and reproducibility of the Block I device. The current Milestone II and draft Milestone III JORD do not reflect this acquisition approach.